**[0091]** **12** maneuver planning
**[0092]** **13** grid map generator
**[0093]** **14** trajectory generator
**[0094]** **15** state space generator
**[0095]** **16** occupancy map generator
**[0096]** **17** generator of the common state space
**[0097]** **18** monitoring process
**[0098]** **20** device
**[0099]** **21** vehicle
**[0100]** **22** obstacle
**[0101]** $c_{i,j}$ grid cell
**[0102]** f degree of freedom
**[0103]** SP starting point
**[0104]** sTP safe target point

**1**. A method for automatically determining and/or monitoring a target trajectory for a vehicle connecting a starting point that corresponds to the current position of the vehicle to a target point, the method comprising:

determining different trajectories of the vehicle that connect the starting point to the target point;

detecting a further target trajectory for each road user, wherein each of the further target trajectories connects the starting point of the respective road user to a target point corresponding to the respective road user;

determining those trajectories of the vehicle as collision-free trajectories that do not result in a collision with one of the further road users in response to the respective road user moving on the target trajectory thereof; and

determining and/or monitoring the target trajectory of the vehicle depending on the collision-free trajectories of the vehicle.

**2**. The method of claim **1**, further comprising:

determining an occupancy map that indicates whether one of the road users is in a certain grid cell of a grid map of a lane in which the vehicle is traveling at a certain point in time; and

determining the collision-free trajectories depending on the occupancy map.

**3**. The method of claim **1**, further comprising:

determining a state space for the vehicle by determining the minimum and the maximum based on the trajectories of the vehicle per grid cell of a grid map of a lane on which the vehicle is traveling for at least one property of points of the trajectories that lie within the respective grid cell,

wherein the determination and/or monitoring of the target trajectory is/are carried out depending on the state space.

**4**. The method of claim **2**, further comprising:

determining a common state space for the vehicle by combining the occupancy map and the state space for the vehicle,

wherein the minimum and the maximum for the at least one property of points on the collision-free trajectories that lie within the respective grid cell are determined based on the collision-free trajectories of the vehicle per grid cell, and

wherein the determination and/or monitoring of the target trajectory is/are carried out depending on the common state space.

**5**. The method of claim **1**, further comprising determining the minimum and the maximum for at least one property of points on the collision-free trajectories that lie within the respective grid cell based on the collision-free trajectories of the vehicle for the grid cells of a grid map of a lane in which the vehicle is traveling,

wherein the target trajectory of the vehicle is determined and/or monitored depending on the minimum and the maximum of the at least one property.

**6**. The method of claim **5**, wherein the at least one property is selected from a group comprising:

a speed of the vehicle;

an orientation of the vehicle; and

a point in time at which the vehicle is in the grid cell according to the respective trajectory.

**7**. The method of claim **5**, wherein a degree of freedom is determined depending on the minimum and the maximum of the at least one property, and the target trajectory of the vehicle is determined and/or monitored depending on the degree of freedom.

**8**. The method of claim **7**, wherein the degree of freedom for at least one certain grid cell is calculated by the following Equation:

$$f_{ci,j}=\alpha(\Delta V_{ci,j}/v)+\beta(\Delta\Psi_{ci,j}/\psi)+\gamma(\Delta T_{ci,j}/t) \quad \text{(A1)},$$

wherein $\alpha$, $\beta$ and $\gamma$ are constants,

wherein $\Delta V_{ci,j}$ corresponds to a difference of the maximum speed and the minimum speed within the grid cell,

wherein $\Delta\Psi_{ci,j}$ corresponds to a difference of the maximum orientation and the minimum orientation within the grid cell,

wherein $\Delta T_{ci,j}$ corresponds to a difference between the maximum time and the minimum time within the cell, and

wherein v, $\psi$ and t are normalization functions.

**9**. The method of claim **7**, wherein the degree of freedom is determined at a first point in time and at a later second point in time, and the target trajectory of the vehicle is determined and/or monitored depending on a comparison between the degree of freedom that is determined at the second point in time and at least one threshold value that is determined depending on the degree of freedom that is determined at the first point in time.

**10**. The method of claim **9**, wherein

a first threshold value and a second threshold value that is smaller than the first threshold value are determined depending on the degree of freedom at the first point in time,

the target trajectory of the vehicle is determined as the target trajectory that was calculated at the first point in time if the degree of freedom calculated at the second point in time is greater than the first threshold value,

the target trajectory of the vehicle is re-calculated if the degree of freedom calculated at the second point in time is smaller than the first threshold value but greater than the second threshold value, and

the determination and/or monitoring of the target trajectory is/are terminated if the degree of freedom calculated at the second point in time is smaller than the second threshold value.

**11**. The method of claim **8**, wherein the degree of freedom is determined for at least one grid cell through which the target trajectory passes.